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NATIONAL DEFENSE UNIVERSITY

JOINT FORCES STAFF COLLEGE

JOINT ADVANCED WARFIGHTING SCHOOL



**PEERING THROUGH THE SURFACE OF A WATER WAR BETWEEN CHINA AND
INDIA**

by

Jin H. Pak

LTC(P), U.S. Army

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by

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes.

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ABSTRACT

Over the past decade, numerous analysts and scholars have speculated about the likelihood of India and China going to war over water with some positing that a future “water war” will occur between these two countries, and others calling such fears overblown. By and large, these arguments focus primarily on how water is unevenly distributed and how China’s upstream behavior, such as damming activities, could instigate conflict with its downstream neighbor, India. But to determine if water insecurity could really cause military conflict between these two states, an extensive analysis of factors affecting relations between India and China, as well as domestic conditions within China, better addresses the question of whether India and China would fight over water.

Water insecurity by itself will most likely not lead to war. However, water insecurity when coupled with other factors, such as increasing water scarcity in the upstream state of a transnational river, linkages between water insecurity and national sovereignty for both the upstream and downstream states, and decreasing political stability in the upstream state, will increase the likelihood of war.

This paper demonstrates that these conditions do exist, and thus, there is increasing likelihood of a water war between China and India. The glaciers in Tibet are indeed melting at a faster rate, and coupled with China’s growing water scarcity and its widening north – south water gap, it will face growing pressure to go through with its upstream water diversion plan. This of course, will threaten India, and given that the downstream portion of the Brahmaputra flows through a disputed area with strong linkages to national sovereignty, it will cause both states to increase their security posture in the region. As China’s economy continues its downward trajectory, it will threaten the Chinese Communist Party’s ability to pursue foreign policy uninfluenced by popular nationalism. All of these trends taken together will increase the likelihood of war between China and India.

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DEDICATION

This paper is dedicated to Lucie, Tyler, and Sophia. They are three of the dearest people in my life, and their love, support, and sacrifice have allowed me to serve my country.

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CONTENTS

I. INTRODUCTION.....	1
II. LITERATURE REVIEW – WATER INSECURITY AND CONFLICT.....	3
Defining Water Insecurity.....	3
Increasing Water Scarcity.....	4
Case for Cooperation.....	6
Case for Conflict.....	9
III. SCENARIO PLANNING METHODOLOGY.....	14
IV. ANALYSIS OF DRIVING FORCES.....	18
Theme A: Growing Water Insecurity Affecting China and India.....	18
<i>Driving Force (DF) #1 –China’s Water Tower of Asia is Leaking.....</i>	<i>19</i>
<i>DF #2 –China’s Growing Water Scarcity.....</i>	<i>21</i>
<i>DF #3 –China’s Future Upstream Activity.....</i>	<i>23</i>
Theme B: National Sovereignty Tied to Water Insecurity.....	26
<i>DF #1 –Sino-Indian Territorial Dispute- a Precarious Hot Spot.....</i>	<i>26</i>
<i>DF #2 –Tibetan Separatism and its Impact on Sino-Indian Relations.....</i>	<i>32</i>
Theme C: Growing Challenges to the CCP’s Political Stability.....	34
<i>DF #1 –China’s Economic Slowdown.....</i>	<i>35</i>
<i>DF #2 –Rise of Popular Nationalism.....</i>	<i>42</i>
V. SCENARIO FORMATION.....	47
VI. RECOMMENDATIONS.....	50
VII. CONCLUSION.....	55
BIBLIOGRAPHY.....	57
VITA.....	66

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I. INTRODUCTION

Over the past decade, numerous analysts and scholars have speculated about the likelihood of India and China going to war over water with some positing that a future “water war” will occur between these two countries, and others calling such fears overblown.¹ By and large, these arguments focus primarily on how water is unevenly distributed and how China’s upstream behavior, such as damming activities, could instigate conflict with its downstream neighbor, India. But to really determine if water insecurity could cause military conflict between these two states, an extensive analysis of factors affecting relations between states, as well as domestic conditions that impact state behavior, better addresses the question of whether states would fight over water.

Using such an approach reveals that water insecurity by itself will most likely not lead to war. However, when coupled with other factors such as increasing water insecurity at the source of transnational rivers; increased water insecurity in the upstream state; linkages between water insecurity and national sovereignty for both upstream and downstream states; and decreasing political stability in the upstream state; war will become more likely.

For applying this sort of analysis, scenario planning provides a useful method for organizing and assessing information. This methodology is an analytical framework that gained prominence in the business sector to help identify possible future scenarios of increased risk by analyzing the driving forces behind a particular problem.² Analysis of these forces allows better understanding of hidden trends impacting a problem, and how they could affect the future. A

¹ For a concise synopsis of the two opposing arguments, see Sudha Ramachandran, "Water Wars: China, India and the Great Dam Rush," *The Diplomat*, April 03, 2015.

² For more information, see Chermack, Thomas J. *Scenario Planning in Organizations: How to Create, Use, and Assess Scenarios*. (San Francisco, Calif: Berrett-Koehler, 2011); and Schwartz, Peter. *The Art of the Long View: Paths to Strategic Insight for Yourself and Your Company*. (New York: Doubleday, 1996).

thorough literature review of the body of scholarly knowledge on the linkage between water insecurity and conflict helped identify driving forces for application using scenario planning.

This paper is organized as follows: a) a review of scholarly literature that defines water insecurity, explains its growing prevalence as an issue, and explores the theoretical relationship between water insecurity and conflict; b) an explanation of scenario planning methodology; c) the findings from applying the methodology to selected driving factors; d) the formation of a conflict scenario between China and India over water insecurity; and e) recommendations for how to prevent such a conflict from occurring.

II. Literature Review - Water Insecurity and War

A review of the body of knowledge pertaining to how water insecurity can cause conflict was crucial for developing a theoretical framework for research. This review aided in the selection of the following independent variables for research: increasing water insecurity at the source of transnational rivers; increased water insecurity in the upstream state; linkages between water insecurity and national sovereignty for both upstream and downstream states; and decreasing political stability in the upstream state. This chapter focuses on a review of the scholarly literature surrounding water insecurity and war. It consists of a definition of water insecurity, the indicators of growing water insecurity, and then reviews both sides of the argument about whether states will go to war over water.

Defining Water Insecurity

Water is one of those rare resources that can damage its environs when scarce and also when plentiful; having too much water in an unpredictable manner such as during flooding can also cause destruction and human misery. As David Grey, a former senior water advisor for the World Bank, and Claudia Sadoff, a lead economic advisor for the World Bank, put it, “[a] striking difference, however, is that unlike food or energy, it is not just the absence of water but also its presence that can be a threat...[the] destructive quality of the resources in its natural, unmanaged state is arguably unique.”¹

Taking into account water’s dual nature, water security is “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production,

¹ David Grey and Claudia W. Sadoff, "Sink Or Swim? Water Security for Growth and Development," *Water Policy* Vol. 9, no. 6 (2007): 547.

coupled with an acceptable amount of water-related risks to people, environment and economies.”² This definition includes both the negative effects of having too little water, or “water scarcity” and damage from having too much water such as floods, contamination, erosion, and epidemics.³ Water insecurity occurs when water is becoming scarce or when it becomes too abundant. This paper focuses on the scarcity component of water insecurity.

Increasing Water Scarcity

People can survive plague, war, natural catastrophes, but they cannot survive without water. Unfortunately, fresh water is an increasingly scarce and precious resource. Less than 2.5 percent of the total water on earth is fresh water, and if one accounts for what is trapped in polar ice and high altitude glaciers around the world, this leaves less than 1 percent of all water as potentially potable.⁴ Yet even this precious little amount is declining due to increasing demand, pollution, and climate change: “global per capita freshwater availability has unstoppably declined for more than a century, plummeting over 60 percent since 1950 alone.”⁵

At the turn of the millennium in 2000, over one billion people could not access clean drinking water.⁶ According to a recent article co-authored by the chair of the Department of Water Engineering at the University of Twente in the Netherlands, and a water scarcity expert from the Johns Hopkins Water Institute, currently, about 66 percent of the world’s population, or

² Ibid., 545.

³ Ibid., 546.

⁴ Brahma Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis* (Lanham: Rowman & Littlefield, 2013), 60.

⁵ Ibid., 62.

⁶ Thomas F. Homer-Dixon, "Scarcity and Conflict," *Forum for Applied Research and Public Policy* Vol. 15, no. 1 (Spring 2000): 28.

over 4 billion people, live in areas under severe water scarcity.⁷ Furthermore, of these four billion people, one billion live in India, and 900 million live in China.⁸ In a 2006 World Bank Working Paper on water scarcity, it claimed that “China will soon become the most water stressed country in East and Southeast Asia.”⁹

Water security is also inherently linked to food security. Agriculture accounts for 70 percent of all global water consumption, compared with 19 percent by industry and about 11 percent for drinking.¹⁰ The Strategic Foresight Group, a prominent India-based think tank that publishes extensively on climate change and environmental issues, projects that both India and China face declines in rice and wheat yields in the 30-50 percent range by 2050 due to “the cumulative effect of water scarcity, glacial melting, disruptive precipitation patterns, flooding, desertification, pollution, and soil erosion.”¹¹ This will also have the added effect of raising global food prices.

Brahma Chellaney, a noted strategic thinker and Professor for Strategic Studies at the New Delhi-based Centre for Policy Research who publishes extensively on water security issues, asserts that water is now the world’s most extracted resource: “Water in the twenty-first century could easily become what oil was to the twentieth century—a source of both wealth and conflict.”¹² Water is already more expensive than oil. According to the U.S. Energy Information Agency, the average retail price for gasoline for all grades on February 1, 2016 was \$1.93 per

⁷ Arjen Y. Hoekstra and Mesfin M. Mekonnen, “Four Billion People Facing Severe Water Scarcity,” *Science Advances*, Vol. 2, (Feb 2016): 3. The two authors assessed water scarcity based on a monthly basis using a ratio between water consumption and water availability. A Water Scarcity (WS) ratio of greater than 2.0 meant that consumption far exceeded water availability, and meant severe water scarcity. By their calculations, over 4 billion people live in areas with a WS score greater than 2.

⁸ Ibid.

⁹ Zmarak Shalizi, “Addressing China’s Growing Water Shortages and Associated Social and Environmental Consequences,” *World Bank Policy Research Working Paper* Vol. 3895 (April 2006): 5

¹⁰ Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 64.

¹¹ *The Himalayan Challenge: Water Security in Emerging Asia*, Strategic Foresight Group, (Mumbai, 2010): iv.

¹² Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 5.

gallon.¹³ Given that the volume of a gallon is 3.785 liters, the price of a liter of oil on that day was about \$0.51, well below the retail price that the U.S. consumer pays for a liter bottle of water.

Case for Cooperation

In the scholarly literature regarding water security, one common refrain is that, “no nations have ever gone to war strictly over access to water, nor are any likely to do so in the future.”¹⁴ Juha Uitto, a director with the United Nations Human Development Programme, and Aaron Wolf, professor of geography at Oregon State University, find that states only fought one war primarily over water, and only seven cases exist of acute water-related violence.¹⁵ Moreover, there have been over 3,600 water related treaties over the years, reflecting a strong record of cooperation.¹⁶ Jack Goldstone, noted professor of sociology and international relations at the University of California, Davis, goes even further to deny any causal link between overall environmental degradation and conflict: “After nearly a decade of research, it now seems clear that long-term environmental degradation of the kind that often accompanies development (e.g.,

¹³ “Weekly Retail U.S. Gasoline and Diesel Prices,” U.S. Energy Information Agency Independent Statistics and Analysis, February 1, 2016, accessed February 7, 2016, https://www.eia.gov/dnav/pet/PET_PRI_GND_DCUS_NUS_W.htm.

¹⁴ Jack A. Goldstone, “Population and Security: How Demographic Change can Lead to Violent Conflict,” *Journal of International Affairs* Vol. 56, no. 1 (Fall 2002): 8.

¹⁵ Juha I. Uitto and Aaron T. Wolf, “Water Wars? Geographical Perspectives: Introduction,” *The Geographical Journal* Vol. 168 (December 2002), 289. The seven cases are: between India and Pakistan in 1948 over access to the Indus basin; between Syria and Israel in 1951 over Israeli water projects in the Huleh basin; between Egypt and Sudan in 1958 over the Nile River; between Somalia and Ethiopia in 1963-1964 over water in the Ogaden desert; between Israel and Syria in 1965-1966 over Arab plans to divert the Jordan River; between Iraq and Syria in 1975 over the Euphrates; and between Mauritania and Senegal in 1989-1991 over grazing right along the Senegal River. See Aaron T. Wolf, “Conflict and Cooperation along International Waterways,” *Water Policy* Vol. 1, no. 2 (Jan 1998): 256.

¹⁶ *Ibid.*, 289; Todd Hofstedt, “China’s Water Scarcity and its Implications for Domestic and International Stability,” *Asian Affairs, an American Review* Vol. 37, no. 2 (Apr-Jun 2010): 77.

soil erosion, deforestation, and air and water pollution) has little or no significant role in generating civil or international wars.”¹⁷

Goldstone explains that the reason for such a weak linkage between environmental scarcity and conflict is that fighting over an environmental resource does not make economic sense as it neither solves the original problem of having insufficient resources, nor provides an efficient way to redistribute the resources. The costs of fighting over resources, far outweigh the costs of finding an alternative source for them or a better way to share the resources through negotiation.¹⁸

In the case of China, analysts note three areas in which China is cooperating with the downstream states, especially with those along the Mekong River in Southeast Asia: first, the exchange of hydrological data; second, confidence building as a dialogue partner in the Mekong River Commission (MRC); and, third, multilateral meetings, particularly under the auspices of the Greater Mekong Subregion (GMS).¹⁹ Likewise, China signed a memorandum of understanding with India agreeing to provide hydrological information during the flood season, and in 2001, it agreed to set up a joint river commission with Kazakhstan.²⁰

Sebastian Biba, research fellow with the Institute of Political Science at Goethe University, Frankfurt, argues that not only is conflict over environmental security unlikely, countries have shown the ability to de-securitize an issue to avoid potential conflict. He explains that de-securitization is the process of moving issues off the security agenda and back into the

¹⁷ Goldstone, "Population and Security: How Demographic Change can Lead to Violent Conflict," 6.

¹⁸ Ibid., 7.

¹⁹ Kayo Onishi, "Interstate Negotiation Mechanisms for Cooperation in the Mekong River Basin," *Water International* Vol. 32, no. 4 (12): 524-537.

²⁰ Sebastian Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," *Journal of Contemporary China* Vol. 23, no. 85 (Sep 2014): 26.

realm of political discourse and “normal” political dispute and accommodation.²¹ In other words, de-securitization is about, “turning threats into challenges and security into politics.”²²

Accordingly, China has steadily promoted concepts like “*heping fazhan*” (peaceful development) and the eight-character regional diplomacy guideline of “*yulin weishan, yilin weiban*” (building good-neighborly relationships and partnerships with our neighbors) in order to reassure smaller states along China’s periphery that they do not have to fear an aggressive and hegemonic China.²³

Even in cases when there is strong evidence of a relationship between environmental degradation and conflict, some scholars argue that other factors are more important. Gunther Baechler’s extensive study of the relationships between environmental change and violent conflict found that while environmental degradation could help trigger ethnic or political conflicts, government negotiation and coordination resolved most such conflicts. And in cases when conflict did pass through the threshold of violence, it depended more on socio-political factors rather than on the degree of environmental degradation.²⁴

²¹ For more about securitization and de-securitization, see Claire Wilkinson, “The Copenhagen School on Tour in Kyrgyzstan: Is Securitization Theory Useable Outside Europe?” *Security Dialogue* Vol. 38, no. 1 (03); and Matt McDonald, “Securitization and the Construction of Security,” *European Journal of International Relations* Vol. 14, no. 4 (Dec 2008).

²² Biba, “Desecuritization in China’s Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtys and Ili Rivers,” 28.

²³ *Ibid.*, 31.

²⁴ Gunther Baechler, *Why Environmental Transformation Causes Violence: A Synthesis*, Environmental Change and Security Project Report of the Woodrow Wilson Center, (Princeton University, 1998)

Counter-argument, Water Can Cause War...

The idea that states will fight over natural resources is not new. In the 1970s, with the 1973 Arab-Israeli War and the ensuing oil embargo, there was a renewed interest in studying whether states might fight over natural resources.²⁵ Some scholars like Geoffrey Kemp, Director of Regional Strategic Programs at the Center for the National Interest, cited a number of factors that could lead to resource wars:

the increasing vulnerability of Western oil supplies to physical interruption and price increases engineered by Third World suppliers; the effects of rapid population growth and high prices upon the economic viability and food supplies of the very poor countries; the scramble for the offshore resources of the world's oceans; and, most basically, the sporadic outbreak of actual fighting over resources in recent years and the tremendous increase in arms sales to states that seek, in large part, to protect their resources and access routes.²⁶

In his 1978 Foreign Affairs article, Kemp asserted that oil was the most likely resource over which states would fight, but he wrote the piece prior to the emergence of the near ubiquitous evidence of climate change and its impact on water security. More recently, Peter Gleick theorizes that environmental security issues will become a more dominant part of international discourse in the post-Cold War era. He elaborates that:

National energy policies will come to depend not only on the price and supply of fossil fuels, but also on the global environmental consequences of certain forms of energy use. Migrating populations in search of more benevolent environmental and social conditions may undermine regional peace and security. Rapidly growing populations, greater demands, and future climactic changes may increase international tensions over shared fresh water resources.²⁷

²⁵ Geoffrey Kemp, "Scarcity and Strategy," *Foreign Affairs* Vol. 56, no. 2 (Jan 1978): 396.

²⁶ Ibid., 396.

²⁷ Peter H. Gleick, "Environment and Security: The Clear Connections," *Bulletin of the Atomic Scientists* Vol. 47, no. 3 (Apr 1991): 17.

Gleick cites the 1991 Iraq War as an example of a war over an environmental resource--energy. In the case of water, he claims that states would fight over access to water because although it is a renewable resource, "in practice [it is] finite, unevenly distributed and often subject to national or regional control."²⁸ In 1978, when Ethiopia publicized its intention to construct dams in the upstream section of the Nile River, Egypt's President Anwar Sadat said, "We depend upon the Nile 100 percent in our life, so if anyone, at any moment, thinks to deprive us of our life we shall never hesitate [to go to war] because it is a matter of life or death."²⁹

Furthermore, water has contributed to fighting in the Middle East between Israel and its Arab neighbors for decades. Located in one of the driest areas on Earth, Israel relies on the Jordan River for much of its water, a resource it shares with the four other riparian states: Lebanon, Syria, Jordan, and the Palestinian Authority.³⁰ Even before the founding of Israel, Israeli Zionists worried about access to fresh water; at the 1919 Paris Peace Conference, the World Zionist Organization insisted on Israel getting control not only of the water resources within the British Mandate of Palestine, but also of the source of these waters in Jordan.³¹ This concern has only grown over time due to Israel's population having increased six-fold and due to the uneven distribution of freshwater in Israel; its primary water sources are located in in the north, away from most of the country's agriculture, industry, and population centers.³²

In the late 1950s, Israel began a project to divert water away from the Jordan River for distribution elsewhere in Israel. Arab states responded with their own project to divert water into Lebanon, Syria, and Jordan. In 1964, the year that the Arab project was supposed to commence,

²⁸ Ibid., 19.

²⁹ Ibid., 20.

³⁰ Meredith Giordano, Mark Giordano, and Aaron Wolf, "The Geography of Water Conflict and Cooperation: Internal Pressures and International Manifestations," *The Geographical Journal* Vol. 168 (December 2002): 295.

³¹ Ibid., 295.

³² Ibid.

the first of a series of border clashes between Israel and Syria occurred that targeted water installations. These clashes contributed to the state of heightened tensions between Israel and the Arab states during which time Egypt mobilized its military along the Sinai Peninsula. Israel responded with a preemptive attack, the 1967 Six Day War.³³

South Africa's water security concerns were a possible motive behind its 1998 decision to deploy troops to Lesotho, the upstream state along the strategically important Orange River.³⁴ Water was also a factor that contributed to the Palestinian Intifada in 1987; during the past 30 years of Israeli occupation of the Gaza, the quality of surface and ground water supplies deteriorated while water-related disease increased.³⁵

Another more recent example is water's role in triggering the Arab Spring uprisings that swept through Northern Africa and the Middle East. The 2010 drought in Russia caused the price of bread to surge across North Africa and the Middle East, which aggravated already growing tensions and sparked riots. As cited in Rebecca Lowe and Emily Silvester's report on water shortages that threaten global security, Grey claimed that although the Arab Spring revolutions were not just about water, it was, "the straw that broke the camel's back...and what we [saw] is water-related shocks in one place reverberating very quickly around the world."³⁶

Chellaney posited that states will fight over water as it becomes a more valuable resource than oil due to the growing price of water and its uneven distribution.³⁷ Lowe's work argues that water can spark conflict when other de-stabilizing factors already exist: "combine water scarcity

³³ Miriam R. Lowi, "Water and Conflict in the Middle East and South Asia: Are Environmental Issues and Security Issues Linked?" *Journal of Environment and Development* Vol. 8, no. 4 (December 1999): 387.

³⁴ Giordano, Giordano, and Wolf, "The Geography of Water Conflict and Cooperation: Internal Pressures and International Manifestations," 292.

³⁵ Ibid., 292.

³⁶ Rebecca Lowe and Emily Silvester, "Water Shortages Threaten Global Security," *IBA Global Insight* Vol. 68, no. 4 (Aug 2014): 42.

³⁷ Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 24.

with political instability, increasing resource demands and climate change, and the ‘perfect storm’ for conflict can be created.”³⁸ While water can help cause war, it would probably not be the sole reason for a war: “when territorial disputes overlap with water wrangles—as has been the case in a number of prominent post—World War II feuds—water is usually an underlying driver rather than an overt instigator of conflicts.”³⁹

Miriam Lowi, noted scholar on water scarcity in the Middle East, argues that the geographical positions of states along a trans-boundary river system also affect the level of cooperation over water distribution with clear advantages going to the upstream state:

The state [that] is the furthest upstream and hence, in the most favorable geographic position, will have no obvious incentive to cooperate. Being at the source of the river, it can utilize as much of the water as it chooses unilaterally, irrespective of downstream needs. It will not cooperate unless coerced to do so. In contrast, downstream states, irrespective of their relative power resources, will seek a cooperative solution because, given their inferior riparian position, they are needier than and, at least in theory, at the mercy of those upstream.⁴⁰

China is the clear upstream superpower of Asia; less than 1 percent of China’s water originates in other countries and its outflows are over 40 times greater than its inflows.⁴¹ In particular, China’s Tibet Autonomous Region is the source of 10 major river systems flowing through South and Southeast Asia. China’s upstream position gives it the power to control downstream water flows. Moreover, there is evidence that China is acting the role of at least an ambivalent, if not uncooperative, upstream hegemon.

³⁸ Lowe and Silvester, "Water Shortages Threaten Global Security," 48.

³⁹ Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 54.

⁴⁰ Miriam R. Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin* (Cambridge: Cambridge University Press, 1993), 10.

⁴¹ Selina Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," *Journal of Contemporary China* Vol. 23, no. 85 (2014): 4.

China was one of only three countries to vote against the Convention of the Law of Non-Navigational Uses of International Watercourses when it was adopted in 1997 by the United Nations General Assembly. Moreover, it has not signed any comprehensive river treaty regulating the issue of water distribution among riparian states, and despite its participation in various dialog sessions, it has been unwilling to become a formal member of multilateral river management institutions such as the MRC.⁴² Even more telling are China's ongoing dam building and proposed water diversion projects, covered in detail later in this paper.

Territorial disputes that overlap areas of resource competition can heighten the potential for inter-state conflict. The competing claims and heightened tensions ongoing in the South China Sea are a rather well known example of this phenomenon. Less well known is that the Northeast Indian province of Arunachal Pradesh, into which the Brahmaputra River flows once it crosses the Indian border from China, is also the scene of a territorial dispute.⁴³ China claims 90,000 square miles of this area, basically the entire province of Arunachal Pradesh, which it calls "South Tibet."⁴⁴

In summary, despite considerable evidence of cooperation over water usage, a number of arguments link water insecurity and armed conflict. While states have not fought exclusively over access to water, increased water insecurity, when combined with other factors such as upstream – downstream positioning, sovereignty linkages, and political instability, may lead to war. These factors provide the basis for useful independent variables for further research and application using scenario planning methodology.

⁴² Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," 25.

⁴³ Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," 14.

⁴⁴ Kerry Bolton, "Water Wars: Rivalry Over Water Resources," *World Affairs* Vol. 14, no. 1 (Spring 2010): 56.

III. Scenario Planning Methodology

Scenario planning is particularly useful to a planner when facing a complex problem in a complex system, such as the water insecurity between India and China and how it could lead to conflict. Of course, in a complex system, the future is hard to predict: “The future often acts like a drunken monkey stung by a bee—it is confused and disturbing, and its behavior is completely unpredictable.”¹ The U.S. Army War College describes the external security environment as being *volatile, uncertain, complex*, and *ambiguous*, or VUCA.² Scenario planning helps a planner understand a complex system by requiring a thorough understanding of underlying driving forces that bear on a particular problem.

Scenario planning first emerged in the 1950s when Dr. Herman Kahn of RAND pioneered a technique he entitled, “future-now thinking,” which focused on combining detailed analyses with imagination to produce scenarios about future nuclear conflict. Most famously, he opined that the best way to prevent nuclear war was to examine the possible consequences of nuclear war scenarios. His work on the possible use and consequences of nuclear war was considered taboo at the time because it challenged the conventional notion that just the mere fact that superpower states had nuclear weapons yielded effective deterrence through the concept of Mutual Assured Destruction (MAD).

Kahn’s creative and thoughtful examination of scenarios in which nuclear armed states would still use nuclear weapons despite MAD fostered concepts such as survivable second strike

¹ Thomas J. Chermack, *Scenario Planning in Organizations: How to Create, use, and Assess Scenarios* (San Francisco: Barrett-Koehler Inc., 2011), xv.

² U.S. Army War College, Department of Command, Management, and Leadership, *Strategic Leadership Primer*, 3rd ed., ed. Colonel (Ret) Stephen J. Gerras (Carlisle, 2010), 1.

capability, civil defense mobilization, and counter-force versus counter-value targeting.³ These concepts greatly improved the ability for Cold War superpowers to conduct more effective nuclear deterrence. Kahn also founded the Hudson Institute where specialization in writing unthinkable future scenarios caught the interest of various companies including Shell, Corning, IBM, and GM.⁴

Shell, in particular, did well applying scenario planning. Pierre Wack, a strategic planner for Royal Dutch/Shell in the 1970s successfully applied scenario planning at a critical time in the oil industry. Similar to the case with Kahn, Wack's application of scenario planning went against conventional thinking at the time, and yielded surprising results for Shell. At that time, the price of oil had long held stable, and there was no obvious reason to think that this would not continue. But Wack and his team researched and analyzed various trends in the Arab region, and realized that the OPEC countries not only could drive up the price of oil, but that they had every incentive to do so. They drafted scenarios that showed what would happen to the oil industry should OPEC commit to such a strategy and prepared Shell to withstand the oil price shock that followed the 1973 Yom Kippur War.⁵ Shell ultimately went from one of the weaker oil companies among seven at the time to one of the two largest and most profitable.⁶

Peter Schwartz, in his book, *The Art of the Long View*, describes the Shell case study in great detail. Schwartz defines scenario planning as, "a tool for ordering one's perceptions about alternative future environments in which one's decision might be played out...for helping us to take a long view in a world of great uncertainty...about making choices today with an

³ Kahn's works also prompted a necessary revision of then President Eisenhower's New Look security strategy. See Herman Kahn, *On Thermonuclear War* (Princeton: Princeton University Press, 1978); and Herman Kahn, *Thinking about the Unthinkable* (New York: Horizon Press, 1962).

⁴ Chermack, 11.

⁵ Peter Schwartz, *The Art of the Long View: Planning for the Future in an Uncertain World* (New York: Currency Doubleday, 1991), 7-8.

⁶ *Ibid.*, 9.

understanding of how they might turn out.”⁷ Schwartz and other scenario planning aficionados cautioned that scenarios are not predictions, but rather a forcing function to help users learn the intricacies of a complex system.⁸ As Schwartz puts it, “to operate in an uncertain world, people need to be able to *reperceive*—to question their assumptions about the way the world works, so they could see the world more clearly... The end result, however, is not an accurate picture of tomorrow, but better decisions about the future.”⁹

The most fundamental and important step for developing scenarios is to research and identify the driving forces within a complex system. These are, “the elements that move the plot of a scenario, [and] determine the story’s outcome.”¹⁰ It is normally beneficial to analyze the following factors as a starting point for investigating driving forces: society, technology, economics, politics, and environment.¹¹ Often, a driving force is not obviously connected to a decision or outcome but reveals the presence of deeper, more fundamental forces behind them.¹² After analyzing these forces, the scenario planner then develops scenarios that, “describe how the driving forces might plausibly behave, based on how these forces have behaved in the past.”¹³ Then, the planner ties the driving forces together through a *plot line*, or logic, to form scenarios.¹⁴

Once scenarios are finally drafted and decisions made, it is important to reassess them during actual execution: “Typically, you will find yourself moving through the scenario process several times—refining a decision, performing more research, seeking out more key elements,

⁷ Ibid., 5.

⁸ Paul J. H. Schoemaker and Cornelius A. J. M. van der Heijden, “Integrating Scenarios into Strategic Planning at Royal Dutch/Shell,” *Planning Review* Vol. 20, no. 3 (May/Jun 1992): 42.

⁹ Schwartz, *The Art of the Long View: Planning for the Future in an Uncertain World*, 9.

¹⁰ Ibid., 102.

¹¹ Ibid., 105.

¹² Ibid., 103.

¹³ Ibid., 135.

¹⁴ Ibid., 136.

trying on new plots, and rehearsing the implications yet again.”¹⁵ Thus, this approach involves constant research to educate decision makers in order to assist them in developing an initial strategy, but also to help identify critical decisions during the execution of that strategy.

¹⁵ Ibid., 27-28.

IV. ANALYSIS OF DRIVING FORCES

Water insecurity by itself is not sufficient to cause conflict. Other factors such as national sovereignty and political stability also play a significant role. In the case of examining how water could lead to war between China and India multiple driving forces were researched along three broad themes: the nature of the growing water insecurity affecting China and India; the linkage between water insecurity and national sovereignty; and the impact of declining political stability. In each of these three themes, specific driving forces are at work that will affect the future for both China and India. The following sub-sections describe these forces in detail.

Theme A: Growing Water Insecurity Affecting China and India

There are three major driving forces that affect the growing water insecurity in China and India: decreasing water availability at the source of much of the water flowing from China to India; increasing water scarcity in upstream China; and China's plans to divert waters from south to north. Ever since China occupied Tibet in 1950, it became the upstream water hegemon for all of South and Southeast Asia. Thus, the strategic value of Tibet goes far beyond the defensive value that its rugged mountain steppes provide. As climate change accelerates the glacier melt in the Himalayas and China is faced with ever increasing water scarcity, it will increasingly look to Tibet as a potential solution for its water distribution issues to the detriment of its many downstream riparian neighbors.

Driving Force #1: China's "Water Tower of Asia" is Leaking

Waterways often traverse political boundaries. There are 276 transnational river and lake basins where water flows through the borders of 148 countries, accounting for three-fifths of all river flows in the world. Additionally, 270 underground aquifers also cross international borders.¹ In the cases where rivers traverse national boundaries, the state that has the upstream portion of a river has a strategic advantage over its downstream riparian neighbors. For many countries in Asia, China is the dominant upstream water power.

China's Tibetan plateau, nestled in the Himalayas, is the source of Asia's 10 major river systems, including the Yellow, Yangtze, Indus, Sutlej, Brahmaputra, Salween and Mekong.² It is no wonder that many refer to Tibet as the "Water Tower of Asia."³ These rivers traverse 11 countries and support 2 billion people stretching from Afghanistan to India in South Asia, and to Vietnam in Southeast Asia.⁴ Due to its upstream position, China enjoys a potential monopoly over the supply of fresh water for almost the whole of South and Southeast Asia.⁵ In fact, China is the source of more transnational water flows than any other upstream power in the world.⁶ In the case of India, both the Indus and Brahmaputra rivers flow downstream from China into its borders.

¹ *Challenges to International Waters: Regional Assessments in a Global Perspective*, United Nations Environment Programme, (Nairobi, 2006); Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 37.

² Of all the major rivers originating in the Himalayas, only the Ganges originates outside Tibet. See Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 78.

³ Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 231.

⁴ Uttam Kumar Sinha, "Examining China's Hydro-Behaviour: Peaceful Or Assertive?" *Strategic Analysis* Vol. 36, no. 1 (01): 42.

⁵ Lowe and Silvester, "Water Shortages Threaten Global Security," 45.

⁶ Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis*, 231.



Map 1. “Major Rivers Sourced in Tibet.”⁷

However, the Water Tower of Asia has sprung a massive leak. Over the next 20 years, the Himalayan region will lose 275 billion cubic meters (BCM) of annual renewable water due to the effects of climate change, while concurrently, the demand for water will continue to increase due to population growth and economic development in China, India, and other states in the region.⁸

Increasing temperatures are fundamentally and irreversibly impacting the earth’s hydrology. The general consensus is that although increased glacier melt due to rising temperatures will cause initial increases in the water flowing along Himalayan glacier-fed rivers, this will ultimately result in irreversible declines in the annual flow of these vital water ways. One illuminating example is the Brahmaputra River, which flows from China through India and Bangladesh. “At the point where the Brahmaputra enters India, the river is expected to reach a 30 percent reduction in annual flow by 2050 and a 60 percent reduction by 2100 because of

⁷ *Major Rivers Sourced in Tibet* [Map]. Climate Change and Its Impact on our World’s Major Rivers – Part 1: The Rivers of Asia. 21st Century Tech. September 4, 2013, <http://www.21stcentech.com/climate-change-impact-major-rivers-asia/> (December 1, 2015)

⁸ “The Himalayan Challenge: Water Security in Emerging Asia,” iii.

climate change factors, in particular rising temperatures in the Tibetan plateau and predictions of 15 percent less precipitation.”⁹

The fact that China is the dominant upstream power, and that the supply of water is decreasing, contributes greatly to the growing water insecurity in China and in downstream countries such as India. China’s own growing water scarcity will exacerbate this growing decline in available water, and will pressure it to look at options that will greatly increase the water insecurity between it and its neighbors.

Driving Force #2: China’s Growing Water Scarcity

After Brazil, Russia, and Canada, China has the fourth largest freshwater resources in the world, but it faces an emerging crisis over water caused by overuse, pollution, and unequal distribution.¹⁰ In 2004, China’s available water per capita was one of the lowest in the world for a populous country, just one-third of the average for developing countries, one-fourth of the world average, and one fifth of the U.S. average.¹¹ This comparison reflects a 23 percent decline in China’s available water per capita over the past two decades.¹² Meanwhile, the demand for water is growing over 10 percent annually in Chinese cities, and over 5 percent annually for its industries.¹³

This precipitous decline in available water has worsened an already critical shortage in drinking water for China’s huge population. Over 25 percent of all Chinese are without access to

⁹ Ibid., 14.

¹⁰ Elizabeth C. Economy, "The Great Leap Backward? The Costs of China's Environmental Crisis," *Foreign Affairs* Vol. 86, no. 5 (September 2007).

¹¹ Shalizi, "Addressing China’s Growing Water Shortages and Associated Social and Environmental Consequences," 4.

¹² Ibid., 5.

¹³ Kathleen Cannon, "Water as a Source of Conflict and Instability in China," *Strategic Analysis* Vol. 30, no. 2 (Apr-Jun 2006): 310.

drinking water.¹⁴ Almost half of China's 668 largest cities are short of water with 108 identified as "serious" and 60 as "critical."¹⁵ By 2030, the Chinese government predicts the country's annual freshwater shortage will reach 200 billion cubic meters, a figure that *exceeds* its current annual consumption.¹⁶

China's growing water scarcity is exacerbated by increased pollution on a historic scale. Over 90 percent of China's underground aquifers, which supply 70 percent of the country's drinking water, are polluted. Consequently, over half of China's population drinks water contaminated with organic waste, and China produces more organic waste than Japan, India, and the U.S. combined.¹⁷ More than 75 percent of surface water flowing along China's rivers is unsafe for drinking or fishing, and 30 percent is unsuitable for agriculture and industry.¹⁸

China's water problem has a stark regional dimension as well with the southern areas of China having the preponderance of the water while the north has the higher demand. This creates a significant regional disparity that is only getting worse with time. While 45 percent of China's population and 60 percent of China's land used for agriculture is in the north, the region has only 13.8 percent of China's fresh water.¹⁹ In per capita terms, the amount of available water in the north is only about 25 percent of that of the south.²⁰

¹⁴ Ibid., 312.

¹⁵ Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 72.

¹⁶ Ibid., 73.

¹⁷ Cannon, "Water as a Source of Conflict and Instability in China," 313.

¹⁸ Economy, "The Great Leap Backward? the Costs of China's Environmental Crisis."

¹⁹ Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtys and Ili Rivers," 30.

²⁰ Shalizi, "Addressing China's Growing Water Shortages and Associated Social and Environmental Consequences," 7.

Driving Force#3: China's Future Upstream Activity

To remedy the great North-South water divide, China started a massive South-North Water Diversion Project to transfer a total of 38–48 billion cubic meters of water annually.²¹ Officially announced by China's State Council in 2002, the project calls for diverting waters along three different axes: "one leg of this project concerns the upgrading of the Grand Canal between Hangzhou and Beijing. The second route connects the Yangtze River to Beijing. The third is expected to divert water from rivers in Tibet and Yunnan to the Yellow River."²² This third route is also known as the Grand Western Water Diversion Project (GWWD), a project that downstream states fear includes plans to divert water from the upstream portions of rivers that flow from Tibet and from China's southeastern Yunnan province, to include the Yangtze, Mekong, Salween, and Yarlung Tansgpo rivers.²³

This is of great concern to downstream India and Southeast Asian states. India views such diversion plans with great trepidation, because they would affect the downstream flow of water in the Brahmaputra river; the Yarlung Tsangpo becomes the Brahmaputra river once it flows across the Indian border.²⁴ This river holds special importance for India for two reasons. First, the river accounts for almost 29 percent of all surface water in India's rivers. Second, the Brahmaputra encompasses roughly 44 percent of all of India's total hydropower potential.²⁵ Of

²¹ Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 74.

²² Jonathan Holslag, "Assessing the Sino-Indian Water Dispute," *Journal of International Affairs*, Vol. 62, no. 2 (Spring 2011): 24.

²³ Hongzhou Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" *Wiley Interdisciplinary Reviews* (October 2015): 4.

²⁴ The Brahmaputra River, India's longest river originates in the Chemayungdung Glacier on the slopes of the Himalayas. At its origin in Tibet, the Chinese call it the Yarlung Tsangpo. The river enters India through Arunachal Pradesh at which point it is known as the Siang River. From here it flows into the plains of Assam where it is known as the Dihang River. The river flows for about 35 kilometres before it is joined by the Dibang and the Lohit rivers. From here on, it is known as the Brahmaputra.

²⁵ Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," 37.

course, China's upstream activities will reduce both the run off and hydropower that India could expect from the Brahmaputra. Considering that India's population is expected to grow by another 500 million by 2050, it is no surprise that water diversion is a serious issue.²⁶

Thus far, the Chinese government has only officially approved the least controversial portion of the GWWDP that diverts the Yangtze River, but India remains concerned about China's future intentions regarding the Yarlung Tsangpo.²⁷ In 1999, China's State Council established a special task force consisting of experts from the Ministry of Water Resources, the Ministry of Land and Resources, China's Science Academy, and other agencies, to conduct a major field study of the GWWDP. After a 36 day field research trip, the task force published a report in support of the water diversion plans outlined in the GWWDP.²⁸ In October 2002, after listening to the report, General Zhao Nanqi, deputy chairman of the ninth Chinese People's Political Consultative Conference (CPPCC) and a former president of the Academy of Military Sciences, stated that, "even if we do not begin this water diversion project, the next generation will. Sooner or later it will be done."²⁹ Then in 2005, Li Lang, an officer from China's second artillery corps published a widely read book which listed various reasons and options for diverting the Yarlung Tsangpo River.³⁰

On the other hand, many Chinese experts have refuted the technical feasibility of the GWWDP. In 2000, the minister of water resources told China's state council that the project

²⁶ Upali A. Amarasinghe, Tushaar Shah, Hugh Turrall, and B. K. Anand, *India's Water Future to 2025-2050: Business-as-Usual Scenario and Deviations*, International Water Management Institute, Research Report 123, (Sri Lanka, 2007): 9.

²⁷ Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" 4.

²⁸ *Ibid.*, 5.

²⁹ Jinshui Cai, "Da xixian' yinggai shang" [Great Western Route Must Be Executed], *Kexue juece* [Scientific Decision-making], December 16, 2016, cited in Holslag, "Assessing the Sino-Indian Water Dispute," 25.

³⁰ The name of the book is *Saving China Through the Water from Tibet* [Xizang zhi shui jiu Zhangguo], cited in Holslag, "Assessing the Sino-Indian Water Dispute," 25.

was technically and economically impossible, and his successor echoed these concerns.³¹ In 2006, China's Engineering Academy, in consultation with numerous academics and experts, produced a report that refuted the findings from the 1999 task force, and asserted that the GWWDP is "not technically feasible in the foreseeable future, and given the development trajectory of China, it is neither practical nor necessary."³²

These conflicting indicators have led to an ongoing debate over the true intentions of Chinese water diversions plans for its western route.³³ China did, however, officially announce plans to build a network of up to five massive dams in the Yarlung Tsangpo for the purposes of generating hydroelectricity, and not water diversion.³⁴ In the fall of 2014, it completed construction of the Zangmu dam, the first of the planned hydro dams along the Yarlung Tsangpo.³⁵ Many in India believe that these hydro-power dams are just the first step in a process to construct the additional infrastructure needed to actually divert water in accordance with the GWWDP.³⁶ Should China go ahead with the GWWDP, it would dramatically increase tensions between it and India. This dynamic is all the more worrisome when one examines the linkage between the Brahmaputra River and national sovereignty.

³¹ Holslag, "Assessing the Sino-Indian Water Dispute," 26.

³² Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" 5

³³ The argument that China may ultimately divert the Brahmaputra headwaters is widely reported in India news media. For a good review of the arguments both for and against China's commitment to diverting the Brahmaputra headwaters, see Jonathan Holslag, "Assessing the Sino-Indian Water Dispute," *Journal of International Affairs*, Vol. 62, no. 2 (Spring 2011); Hongzhou Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" *Wiley Interdisciplinary Reviews* (October 2015); and "South Asia's Water Unquenchable Thirst," *The Economist*, November 19, 2011.

³⁴ Lowe and Silvester, "Water Shortages Threaten Global Security," 45.

³⁵ Ananth Krishnan, "China Puts First Brahmaputra Dam into Operation," *India Today*, November 23, 2014, <http://indiatoday.intoday.in/story/brahmaputra-dam-india-vs-china-zangmu-yarlung-tsangpo-zangbo-hydropower-project/1/403379.html>.

³⁶ Ramachandran, "Water Wars: China, India and the Great Dam Rush."

Theme B: National sovereignty Tied to Water Insecurity

The area in which China's Yarlung Tsangpo River becomes India's Brahmaputra River is called Arunachal Pradesh, and China and India both claim it. This territorial dispute is all the more sensitive because it is linked to the national sovereignty of both countries. For China, it is linked to its claims over Tibet. For India, the Arunachal is the site of a humiliating defeat by a Chinese surprise attack. In light of this, two driving forces emerge that impact how much national sovereignty is linked to water insecurity: the actual territorial dispute and how it links to national sovereignty for both countries, and the Tibetan separatist movement. Both of these factors are crucial to understand that water insecurity between India and China is about much more than the actual water itself.

Driving Force #1: Sino-Indian Territorial Dispute

The Arunachal territorial dispute between India and China is particularly important to determining the likelihood of war between these two countries over water, because it is the area in which the Brahmaputra River flows after it crosses their contested border and ceases to be known as the Yarlung Tsangpo. Furthermore, the dispute is linked to much greater core national interests for both great powers. China cannot give up its claim to the Arunachal without simultaneously weakening its sovereignty claim to Tibet, which it took by force in 1950. For India, the Arunachal is the site of a humiliating defeat by the Chinese in 1962, greatly influencing the Indian political psyche and driving increasing Indian defense investment in the province.

From China's perspective, political control over Tibet is a matter of national sovereignty, territorial integrity, and security. The CCP claims that China's sovereignty over Tibet traces back 700 years to the Yuan (Manchu) Dynasty.³⁷ Furthermore, the CCP perceives its sovereignty over Tibet as an essential part of restoring China's national pride and security. In their view, after the fall of the Qing Dynasty in 1911, Great Britain exploited China's weakened condition and recognized Tibet as an independent state and negotiated new borders. Shortly after the Qing Dynasty fell, the government of India, which was still a colony of Great Britain at the time, hosted a meeting between its representatives, those from Great Britain, and those from Tibet in Simla, India.³⁸ There, they drew up the borders of a newly independent Tibet in what became known as the Simla Accord of 1914, because the British desired a strategic buffer between India and China. The Chinese view this as an example of the national humiliation that it endured from foreign powers during this period.³⁹

The Simla Accord effectively created two sets of borders between India and Tibet, one on either side of Nepal. The western border is known as the Johnson line, dividing Kashmir from Tibet, and the eastern is called the McMahon line, dividing Arunachal from Tibet. Both lines were named after British diplomats.⁴⁰ China refused to acknowledge this agreement, because it claimed that Tibet was still part of China at the time and did not have the authority to make any international agreements.⁴¹ In fact, the Chinese leadership determined that recognizing either

³⁷ Sperling, Elliot. "Tibet and China: The Interpretation of History since 1950." *China Perspectives* Vol. 2009, no. 3 (September 2009): 26.

³⁸ Ramachandra Guha, "The Dalai Lama's War," *National Interest*, no. 115 (September 2011): 47; Sikri, "The Tibet Factor in India-China Relations," 59.

³⁹ Sikri, "The Tibet Factor in India-China Relations," 60.

⁴⁰ Bruce Riedel, "JFK's Overshadowed Crisis," *National Interest*, no. 120 (July 2012): 55.

⁴¹ In fact, during the Chinese Civil War, both the Guomindang Nationalists and the CCP claimed all of Tibet as part of China. See Michael Clarke, "Ethnic Separatism in the People's Republic of China History, Causes and Contemporary Challenges," *European Journal of East Asian Studies* Vol. 12, no. 1 (2013): 112.

border outlined in the Simla Accord would challenge the legitimacy of its claim of sovereignty over Tibet:

Chinese leaders understood very well that, were they to recognize the validity of the McMahon Line, it would imply that Tibet at that time was an independent state with treaty-making powers. From a political perspective, this was impossible for China to accept, since, unless Tibet was recognized as an inalienable part of China not only in 1951 but historically as well, the Chinese takeover of Tibet lacked legitimacy and would always be considered an imperial conquest.⁴²

In this manner, the Arunachal territorial dispute became linked to a core issue for China—its claim of sovereignty over Tibet. Once China invaded and occupied Tibet in 1950, both the Johnson Line and the McMahon Line became contested borders between India and China. Map 2 shows both the Johnson and McMahon Lines in red on either side of Nepal, and Map 3 indicates the Arunachal Pradesh territory.



Map 2. China-India Border⁴³

⁴² Sikri, "The Tibet Factor in India-China Relations," 60.

⁴³ *China – India Border* [Map]. India-China Border Dispute. Global Security. http://www.globalsecurity.org/military/world/war/india-china_conflicts.htm (December 7, 2015)



Map 3. China-India Border with Arunachal Pradesh Outlined⁴⁴

As stated, China does not recognize the Simla Accord, and claims the entire Arunachal Pradesh. This disputed area is not only the site of a territorial dispute between China and India, it is also the scene of a Chinese invasion. In 1959, just nine years after the Chinese occupied Tibet, a revolt broke out by Tibetans against Chinese rule. It was put down, and the Dalai Lama fled to India in March 1959, where he was given refuge. This angered the CCP leadership. A war of words escalated, and by that autumn, sporadic clashes erupted between Indian and Chinese troops along the border. In October 1962, the PRC launched a major invasion of both the western and eastern sector of their contested borders with India. In the west, where the fighting occurred in the Kashmir region, the Indians resisted stoutly, but in the east Chinese

⁴⁴ "South Asia's Water Unquenchable Thirst," *The Economist*, November 19, 2011. <http://www.economist.com/node/21538687> (March 01, 2016).

armed forces swept through the Brahmaputra Valley deep into Arunachal Pradesh and routed the Indian military.⁴⁵

Hostilities continued for over a month, during which China wrested over 20,000 square kilometers of territory from India and inflicted heavy casualties. The Indian government acknowledged the loss of over 7,000 personnel, with 1,383 dead, 1,696 missing in action, and 3,968 captured. Then, quite suddenly, on November 21st, China announced a unilateral ceasefire, and returned to border posts held by its army prior to the conflict.⁴⁶

The war changed forever the nature of Sino-Indian relations. Many Indians saw it as a grave act of betrayal by the Chinese leadership despite the sincere and painstaking efforts by then Indian Prime Minister (PM), Jawarhlal Nehru, to foster peaceful relations with the new communist government in China. Nehru, the first PM of a newly independent India in 1947, invested much of his political capital into developing this relationship throughout his tenure up until the 1962 war. He oversaw the drafting and signing of the Panchsheel Agreement, otherwise known as the “Five Principles of Peaceful Coexistence,” between India and China.⁴⁷ The 1962 Sino-Indian War effectively reversed these advances in Sino-Indian relations in one quick stroke.

Since then, the dispute over the Arunachal continues to serve as a main point of contention in Sino-Indian relations and as a potential trigger point for renewed military conflict despite a period of warming relations and increased trade between the two countries.⁴⁸ Even before President Hu’s historic visit to India in 2006, the Chinese ambassador to India made a

⁴⁵ Guha, "The Dalai Lama's War," 49.

⁴⁶ Gyanesh Kudaisya, "Beyond the 'Himalayan Pearl Harbor'," *History Today* Vol. 62, no. 11 (Nov 2012), 3.

⁴⁷ *Ibid.*, 3.

⁴⁸ From the 1980s to recently, India and China have entered into a period of detente highlighted with the signing of the, “Declaration of Principles for Relations and Comprehensive Cooperation” in 2003 and then the, “India-China Strategic and Cooperative Partnership for Peace and Prosperity” in 2005. But despite all of this, the territorial dispute over the Arunachal remained unresolved. See Sikri, "The Tibet Factor in India-China Relations," ; and Sujit Dutta, "Revisiting China's Territorial Claims on Arunachal," *Strategic Analysis* Vol. 32, no. 4 (07).

statement on an Indian news channel asserting Beijing's claim to the entire Arunachal Pradesh area, casting a shadow over Hu's visit.⁴⁹ To further emphasize this point, China refused to give a visa to a visiting Indian official from Arunachal Pradesh on the grounds that, as the region was a part of China, the official did not need a visa.⁵⁰ Moreover, in 2009, China refused to endorse an Asian Development Bank project in Arunachal Pradesh, on the grounds that the area for the project was in China.⁵¹

Consequently, India has continued a military buildup in and around the Arunachal. In 2008, when Indian PM Manmohan Singh visited the province, he announced a major infrastructure development package, and appointed a retired Army Chief of Staff to the post of governor.⁵² In 2009, India deployed an additional 60,000 Soldiers to Assam, near Arunachal Pradesh, bringing the total number of troops in the area to 100,000.⁵³ It also built three new airstrips in the Himalayan foothills.⁵⁴ In 2014, India announced plans to build 54 border posts in Arunachal Pradesh.⁵⁵ Meanwhile, China has invested heavily in improving its military infrastructure in Tibet. Since 2000, it has established "five fully operational air bases, several helipads, an extensive rail network, and 36,000 miles of roads—giving them the ability to rapidly deploy 30 divisions (appx. 15,000 soldiers each) along the border, a 3-to-1 advantage over India."⁵⁶

⁴⁹ Jing-Dong Yuan, "The Dragon and the Elephant: Chinese-Indian Relations in the 21st Century," *Washington Quarterly* Vol. 30, no. 3 (Summer 2007): 138. Also in 2007, the Chinese Foreign Minister Yang Jieshi reiterated the PRC's claim on Arunachal during his talks with the Indian External Affairs Minister Pranab at the sidelines of the G-8+5 meeting in Germany, see Dutta, "Revisiting China's Territorial Claims on Arunachal," 556.

⁵⁰ Sikri, "The Tibet Factor in India-China Relations," 64; Bolton, "Water Wars: Rivalry Over Water Resources," 56.

⁵¹ Sanjeev Miglani, "India, China take a measure of each other at border row talks," *Reuters*, August 5, 2009, <http://blogs.reuters.com/india/2009/08/05/india-china-take-a-measure-of-each-other-at-border-row-talks/>.

⁵² Dutta, "Revisiting China's Territorial Claims on Arunachal," 572.

⁵³ Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," 14.

⁵⁴ Bolton, "Water Wars: Rivalry Over Water Resources," 61.

⁵⁵ "China expresses concern about Indian plan to build border posts," *Reuters*, October 30, 2014, <http://www.reuters.com/article/2014/10/30/us-china-india-idUSKBN0IJ14G20141030>.

⁵⁶ Mohan Malik, "'Victory Without Bloodshed': China's India Strategy," *The Diplomat*, August 20, 2013.

And yet despite this buildup of military capability on both sides of the border, incursions into disputed areas are dangerously quite common. The Indian government has reported that during a three year period since 2012, Chinese soldiers conducted 600 incursions into disputed areas along the India-China border.⁵⁷ The net result of the military buildup, aggressive patrolling, and border incursions is that the Chinese – Indian border has become an increasingly dangerous hotspot in recent years.

Driving Force #2: Tibetan Separatism and its Impact on Sino-Indian Relations

Since the Arunachal is the area through which the Yarlung Tsangpo becomes the Brahmaputra River, the territorial dispute between China and India over this area is closely related to water insecurity. But because the Arunachal is indirectly linked to China's sovereignty claim over Tibet and India hosts the Dalai Lama in exile, Tibetan separatism also emerges as a driving force behind how water insecurity could cause war.

In March 2008, Tibetan riots sprang up in the biggest challenge to Chinese rule in two decades. While the Chinese government claimed that only 19 people died and 382 were injured, the Tibetan Government in Exile (TGIE) and rights groups claim 220 Tibetans killed, 1,294 injured, and over 5,000 arrested or detained.⁵⁸ In the days immediately following the outbreak of violence, Tibetans carried out 96 protests throughout the region, and Chinese internal reports projected that about 30,000 Tibetans participated.⁵⁹ The riots spread to the Tibetan diaspora in other provinces such as Sichuan, where protestors carrying rocks and homemade bombs stormed

⁵⁷ Ibid. The Indian government routinely tracks and reports incursions by Chinese military patrols into various disputed areas that India administered which China claims. This number covers all of these areas, and not just Arunachal Pradesh.

⁵⁸ Tsering Topgyal, "Insecurity Dilemma and the Tibetan Uprising in 2008," *Journal of Contemporary China* Vol. 20, no. 69 (2011): 183.

⁵⁹ Ibid., 189.

government offices, police stations, hospitals, schools, banks, shops, and markets.⁶⁰ This was especially concerning to the CCP because it occurred during the lead up to the 2012 Beijing Olympics.

While Tibetans claimed that their deep-rooted resentment of Chinese repressive policies caused the violence, China claims that the uprising was planned and organized by the Dalai Lama in exile in India.⁶¹ After the Dalai Lama fled to India in 1959, he established the TGIE. Since then, it has become an international force with embassy-like missions in 13 cities around the world to include New York and London. Six TGIE departments handle everything from public health to elections for a 43-member parliament every five years.⁶² The TGIE has also succeeded in maintaining U.S. support in the post-Cold War era and has effectively internationalized the Tibetan issue.⁶³

Over the past few decades, however, a schism is developing between the Dalai Lama and contemporary Tibetans. On the one side, the Dalai Lama advocates a, “Middle Way Approach,” for greater Tibetan autonomy under Chinese sovereignty. On the other side is a younger generation of Tibetan leaders who are challenging the Middle Way and pushing for a fully independent Greater Tibet. The development of a separate political activist group, the Tibetan Youth Congress, with 30,000 members is evidence of this schism. While they respect the Dalai Lama as a spiritual leader, they believe he has largely failed, and that demonstrations and direct confrontation for independence are better tactics than political maneuvering and negotiations for

⁶⁰ Wie Davis Van, "Tibetan Separatism in China," *Korean Journal of Defense Analysis* Vol. 21, no. 2 (June 2009): 156.

⁶¹ Topgyal, "Insecurity Dilemma and the Tibetan Uprising in 2008," 184.

⁶² Van, "Tibetan Separatism in China," 158.

⁶³ Clarke, "Ethnic Separatism in the People's Republic of China History, Causes and Contemporary Challenges," 129.

greater autonomy.⁶⁴ Tibetans outside of China have also formed the Tibetan People's Uprising Movement (TPUM), which seeks to engage in "direct action" to end China's occupation of Tibet, and is openly critical of the TGIE's preference for non-violent tactics.⁶⁵

The Chinese perceive that it is because the Dalai Lama lives in India that he can keep in close touch with the Tibetan community inside Tibet. In China's view, India has given the Tibetan community the ability to preserve their distinct language, culture, history, and traditions and to keep the fire of Tibetan nationalism burning, and thus, any political activity that the Tibetan groups conduct around the world is possible only because they have a secure base in India.⁶⁶ As the movement in support of Tibetan autonomy or independence continues, it creates a prevailing challenge to relations between India and China and will limit the ability for both countries to resolve their water insecurity peacefully, especially when coupled with rising political instability in China.

Theme C: Growing Challenges to the CCP's Political Stability

As China's economy continues to slow down, the CCP's ability to maintain legitimacy is increasingly challenged. Some are even predicting an economic depression or recession. This will threaten the CCP's ability to deal with rising social unrest and popular nationalism, and will ultimately challenge the CCP's ability to maintain a monopoly over control of foreign policy, a development that does not bode well for how China will approach water insecurity with India. The following sub sections analyze the impact of the driving forces of China's economic slowdown and rising popular nationalism.

⁶⁴ Van, "Tibetan Separatism in China," 159.

⁶⁵ Clarke, "Ethnic Separatism in the People's Republic of China History, Causes and Contemporary Challenges," 131.

⁶⁶ Sikri, "The Tibet Factor in India-China Relations," 65.

Driving Force #1: China's Economic Slowdown

Ever since economic reforms ushered in by Deng Xiaoping in the 1980s, the CCP focused on promoting economic growth in order to build its national power and to maintain its legitimacy as China's ruling political party. Over the past two decades, this resulted in tremendous economic growth and rising living standards, but it also increased an income gap between rich and poor, rising expectation by the Chinese people for better services, and increased environmental degradation.⁶⁷

But now China's GDP growth rate is slowing, and an increasing number of analysts are worried that China will enter into a prolonged period of slower growth or even an outright recession. This would severely test the CCP's ability to deal with environmental issues such as water scarcity, and increased social unrest. A major contributing factor to China's declining economy is the tremendous growth of nongovernment debt and overcapacity that China has accumulated since the 2008 Global Financial Crisis (GFC).

In response to the 2008 GFC, the Chinese government announced a major fiscal stimulus package and adopted measures to relax monetary policy.⁶⁸ And since the main instrument of fiscal policy in China is spending on infrastructure and social programs, the central government encouraged local governments to increase funding such projects.⁶⁹ This resulted in the

⁶⁷ Randall Peerenboom, "China and the Middle-Income Trap: Toward a Post Washington, Post Beijing Consensus," *Pacific Review* Vol. 27, no. 5 (2014): 663.

⁶⁸ Yinqiu Lu and Tao Sun, "Local Government Financing Platforms in China: A Fortune or Misfortune?" *IMF Working Paper*, no. WP 13/243 (October 2013): 8.

⁶⁹ Chaoying Qi, James Juniper, and James Xiaohe Zhang, "'Minsky Moment' and Financial Fragility: The Case of China," *The Journal of Developing Areas* Vol. 49, no. 6 (April 2015): 286; Gang Fan and Yan Lv, "Fiscal Prudence and Growth Sustainability: An Analysis of China's Public Debts," *Asian Economic Policy Review* Vol. 7 (2012): 207-208.

establishment of Local Government Financing Platforms (LGFPs).⁷⁰ The net result of these policies contributed to an extraordinary growth in China's non government debt to GDP ratio. In 2015, this ratio exceeded 200 percent of GDP, almost double the 125 percent reported in 2008.⁷¹ According to a 2015 report by McKinsey consulting, China's total debt to GDP ratio approached 300 percent when combining non government and government debt:

Fueled by real estate and shadow banking, China's total debt has nearly quadrupled, rising to \$28 trillion by mid-2014, from \$7 trillion in 2007. At 282 percent of GDP...three developments are potentially worrisome: half of all loans are linked, directly or indirectly, to China's overheated real-estate market; unregulated shadow banking accounts for nearly half of new lending; and the debt of many local governments is probably unsustainable.⁷²

No wonder that on March 3, 2016, Moody's downgraded its outlook on Chinese debt from "stable" to "negative."⁷³ How to explain such a large growth in debt in such a short period of time? The answer lies in the nature of China's system for funding public spending and its ongoing failure to transition from an export-oriented economy to one fueled by domestic consumer spending. In China, only the central government is allowed to issue government bonds of any type.⁷⁴ Local governments are not allowed to issue bonds or borrow from commercial banks.⁷⁵ Furthermore, the central government regulates the ability of local governments to raise revenues through what is known as the Tax Sharing System, in which local

⁷⁰ Lu and Son, "Local Government Financing Platforms in China: A Fortune or Misfortune?" 4.

⁷¹ Ye Xie, "China's Debt-to-GDP Ratio Just Climbed to a Record High," *Bloomberg Business News*, July 15, 2015. <http://www.bloomberg.com/news/articles/2015-07-15/china-s-debt-to-gdp-ratio-just-climbed-to-a-new-record-high>

⁷² Richard Dobbs, Susan Lund, Jonathan Woetzel, and Mina Mutafchieva, "Debt and (not much) deleveraging," *McKinsey Global Institute Report* (February 2015): vi.

⁷³ "Moody's cuts China outlook on eve of NPC, cites reform, fiscal risks" *Reuters*, March 3, 2016, <http://in.mobile.reuters.com/article/idINKCN0W408K?irpc=932>.

⁷⁴ Qi, Juniper, and Zhang, "'Minsky Moment' and Financial Fragility: The Case of China," 286.

⁷⁵ Fan and Lv, "Fiscal Prudence and Growth Sustainability: An Analysis of China's Public Debts," 204.

government revenues are limited to a percentage of national tax revenues.⁷⁶ In order to raise the revenue needed to increase fiscal stimulus, local governments looked to the non-government sector to raise funds for public projects:

As the local governments are forbidden to borrow, either from the public or from the commercial banks, the only way for them to extend their budgets is to borrow through some other entities, either a local government-owned corporation (such as city construction company) or a public financial institution (such as provincial trust fund), which take the bank loans on behalf of the local governments and which are backed up by either government credibility (government guarantee against future fiscal revenues), and/or some collaterals such as land or other public properties, and/or a legally secured future cash flow of the projects concerned. The corporations or institutions that carry out these borrowings are, therefore, called the “platforms” for local governments’ borrowings.⁷⁷

These “platforms” are also known as LGFPs, and are treated as municipal State Owned Enterprises (SOEs) under China’s company law. They are focused primarily on public welfare projects such as affordable housing construction, infrastructure development, social services, and environmental protection.⁷⁸ To finance these projects, local governments provide LGFPs with capital through the direct transfer of government revenue, land use rights, or other real property assets such as roads and bridges.⁷⁹ LGFPs then use this capital as collateral to obtain the financing they need from Chinese banks to finance the projects that local governments want the LGFPs to execute. Figure 1 explains this close relationship between local governments, LGFPs, and the banks.

⁷⁶ Qi, Juniper, and Zhang ““Minsky Moment” and Financial Fragility: The Case of China,” 286; Fan and Lv, “Fiscal Prudence and Growth Sustainability: An Analysis of China’s Public Debts,” 203.

⁷⁷ Fan, and Lv, “Fiscal Prudence and Growth Sustainability: An Analysis of China’s Public Debts,” 203.

⁷⁸ Lu and Son, “Local Government Financing Platforms in China: A Fortune or Misfortune?” 4.

⁷⁹ Ibid.

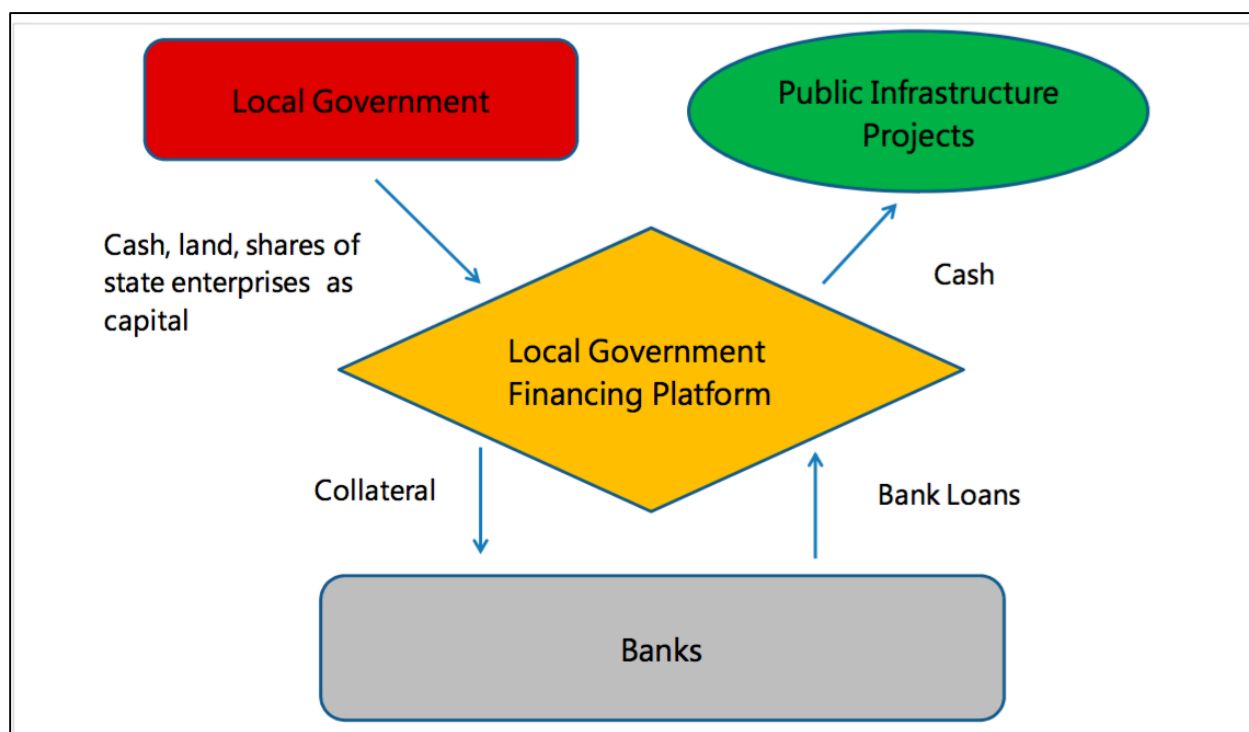


Figure 1. Relationship Between Local Governments, LGFPs, and Banks⁸⁰

Local governments have strong incentives to borrow as much as they can in order to achieve higher economic growth in their locales as evidence of “achievement,” and government officials typically rotate out of office well before the majority of debts mature.⁸¹ As a result, this relationship between local government, local government owned businesses, and state owned banks has produced far more capacity than is demanded by foreign and domestic markets in industries such as housing, steel, cement, construction, iron, and other goods.⁸² More than one in five homes in China’s urban areas are vacant.⁸³ At the macro level, China’s real estate activity is as much as of 20 percent of GDP. To put this in perspective, at the height of the U.S. real estate

⁸⁰ Ibid.

⁸¹ Fan, and Lv, “Fiscal Prudence and Growth Sustainability: An Analysis of China’s Public Debts,” 212.

⁸² Vague, “The Coming China Crisis,” 17.

⁸³ Vague, “The Coming China Crisis,” 21.

market prior to the 2008 crisis, real estate was 6 percent of U.S. GDP.⁸⁴ As an indicator of over-investment in construction projects, China used more cement in 2011-2013 than the U.S. did in the *entire 20th century*.⁸⁵

Of course, all of this growth in capacity is not an issue as long as demand keeps pace, but China faces a world economy with significantly less demand after the 2008 crisis. Moreover, China has yet to transition from an export-focused economy to one that relies more on domestic consumption. As a result, over-investment and increased lending has markedly increased the fragility of China's economy, since the riskiness of these loans are dependent on the profitability of the projects they finance. If the projects generate enough revenue, they do not contribute to additional fiscal risk.⁸⁶ Unfortunately the opposite is happening. By some estimates, China has compiled a staggering \$2-3 trillion in bad loans.⁸⁷

All this over-capacity and bad debt is impacting China's GDP growth rate. Its nominal GDP growth rate declined from over 15 percent in 2011 to around 7 percent in 2014. Many analysts believe that the actual figure was closer to 4 percent.⁸⁸ This slowdown is all the more problematic in terms of political stability for the CCP due to the growing income gap between the haves and have-nots in China, an uncomfortable irony for a party whose originating ideology was based on communism.

Any prolonged slowdown in China's economy limits the government's ability to provide sufficient services for its severely over-urbanized population, and it hamstring its ability to implement water conservation programs necessary to deal with growing water scarcity. Over the

⁸⁴ Ibid.

⁸⁵ Ibid., 21.

⁸⁶ Qi, Juniper, and Zhang, "'Minsky Moment' and Financial Fragility: The Case of China," 288.

⁸⁷ Vague, "The Coming China Crisis," 17.

⁸⁸ Ibid., 22; Qi, Juniper, and Zhang, "'Minsky Moment' and Financial Fragility : The Case of China," 279.

last two decades, 300 million people have migrated from rural areas to China's cities and are utterly dependent on urban jobs.⁸⁹ For instance, in the city of Shenzhen, more than 80 percent of its population of 18 million are migrants without local permanent residence permits.⁹⁰ Over 3 million of Shanghai's 17 million residents are migrant workers. These migrants often live in shantytowns, overcrowded dorms, public places, and are without basic social services.⁹¹

The fact that so many people are without social services is an irony for any communist country. One reason for this paradox lies in China's household registration system, known as "hukou." Instituted in 1958, the hukou system requires every citizen seeking a change in residence to obtain permission from the public security bureau, but such requests rarely got approved. Those Chinese already registered in urban areas have substantial benefits such as access to coveted jobs in the state sector, housing, public schooling, and health care. In effect, hukou is an internal passport system where moving within or across provincial boundaries is analogous to moving across international boundaries.⁹²

The vast majority of Chinese who migrated to urban areas did not get approved changes to their registration status and are unable to access benefits. Hence, they are often referred to as migrant workers. For these people, continued employment in the commercial sector is vital for their livelihood. This means that a slowdown in economic growth will likely trigger increased social unrest, something that greatly worries the CCP.

Chinese economic decline also severely limits the government's ability to cope effectively with growing water scarcity. For example, in many countries, lowering food

⁸⁹ Goldstone, "Population and Security: How Demographic Change can Lead to Violent Conflict," 16.

⁹⁰ Neil Cough, "Shenzhen Landslide Casts Shadow Over China's Success Story," *New York Times*, December 23, 2015.

⁹¹ Cannon, "Water as a Source of Conflict and Instability in China," 316.

⁹² For a more thorough explanation of the Hukou system, see Shuming Bao et al., "The Regulation of Migration in a Transition Economy: China's Hukou System," *Contemporary Economic Policy* Vol. 29, no. 4 (10).

production is one option for at least partially addressing water scarcity. Since agriculture consumes 70 percent of China's available water, importing more food from abroad would increase freshwater supplies, an approach commonly known as "virtual water."⁹³ But for China, this option is problematic, as declining agricultural production would only increase the number of migrant workers in China's already over-urbanized cities.⁹⁴

Any slowdown in agricultural output would also increase food prices, which could also incite unrest.⁹⁵ To prevent this, the CCP has long practiced measures to keep prices artificially low. With regard to water, the government has artificially kept water prices well below what the market would allow. Resorting to market pricing would result in price increases of up to 1,500 percent in a society culturally resistant to paying for water.⁹⁶ Urban dwellers would see their quality of life plummet, as jumps in food and water prices lead to an increase in the cost of living.⁹⁷

In fact, any large-scale effort to lower water consumption could worsen the already slowing Chinese economy. Furthermore, any significant additional regulation and limits placed on water usage would increase manufacturing costs, likely slowing output and creating resentment on the part of the manufacturing elite. The lower and middle classes would feel that these effects as well as a slowing economy would hinder upward mobility and increase unemployment. Political opposition elites would exploit widespread feelings of disaffection.⁹⁸

Indeed, the data for social unrest indicate that this is already happening. In the short three-year period between 2008 and 2010, the Chinese government dealt with over 90,000

⁹³ Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 75; Shalizi, "Addressing China's Growing Water Shortages and Associated Social and Environmental Consequences," 14.

⁹⁴ Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 75.

⁹⁵ Ibid., 76.

⁹⁶ Ibid., 76.

⁹⁷ Ibid., 76-77.

⁹⁸ Ibid., 75.

protests annually.⁹⁹ As the economy continues to slow and social unrest rises, the CCP will need to resort to other approaches such as nationalism to maintain political stability. This action, however, will entail its own risks, especially in the realm of how it conducts foreign policy.

Driving Force #2: Rise of Popular Nationalism

Ever since the capitalist reforms under Deng Xiaoping, the CCP has based their legitimacy on economic growth and nationalist ideology. In fact, up until the mid-1990s, the CCP was able to “decide the direction, content, and intensity of Chinese nationalism, and then to mobilize the people...[it] could appeal to nationalism whenever it so wished, and dismiss it whenever it needed to shift its policy.”¹⁰⁰ The CCP employed an “official nationalism discourse” that it constructed as a way to boost its domestic legitimacy.¹⁰¹

But a slowing economy and rising popular nationalism are impacting a CCP leadership that is more exposed to public opinion than ever before, and constraining the ability of China’s political elites to coolly pursue China’s national interests.¹⁰² This rising wave of popular nationalism began in the 1990s, when a series of incidents convinced the Chinese that the West (with Japan included) harbored ill intentions toward China: the selling of advanced fighter planes to Taiwan, the search of a Chinese cargo ship, the opposition to China’s bid to host the 2000 Olympics, the accidental bombing of a Chinese embassy in Kosovo, the Japanese

⁹⁹ Elizabeth Economy, U.S. - China Economic and Security Review Committee, *Roots of Protest and the Party Response in China*, First Session, 112th Congress sess., Feb 25, 2011,

¹⁰⁰ Zemin Chen, “Nationalism, Internationalism, and Chinese Foreign Policy,” *Journal of Contemporary China* Vol. 14, no. 42 (February 2005): 50.

¹⁰¹ *Ibid.*, 53.

¹⁰² Peter Gries, “Chinese Nationalism: Challenging the State?” *Current History* (September 2005): 252.

sovereignty claim on the Diaoyu Islands, the denouncing of China in the name of human rights, and the deployment of aircraft carriers in the vicinity of the Taiwan Strait.¹⁰³

In spring 2005, amid fears that Japan could earn a permanent seat on the UN Security Council, tens of millions of Chinese signed internet petitions against Japan's bid. At the same time, the Japanese minister of education approved textbooks that many Chinese criticized as whitewashing Japanese wartime atrocities. These two developments triggered massive anti-Japanese protests in Chinese cities spanning 20 provinces which were organized almost exclusively by e-mail, text messaging, and online chat-rooms.¹⁰⁴

The emotional and mobilizing nature of popular nationalism, when combined with a slowing economy, is leaving Chinese political elites more exposed to nationalist opinion. In the past, Chinese leaders applied pragmatic controls to nationalism, at times constraining it or promoting it depending on the national and political interests at stake.¹⁰⁵ For example, at the height of the 2005 anti-Japanese demonstrations, the Chinese government took measures to halt them because the growing size and publicity of the protests impacted the government's foreign policy interest in maintaining productive relations with Japan.¹⁰⁶ In the words of a prominent China scholar, "talking tough but acting in a calculated manner helped Chinese leaders prevent the rise of popular nationalism from damaging China's relations with the U.S. and Japan."¹⁰⁷

The CCP also took steps to halt anti-US demonstrations after the 1999 accidental bombing of the

¹⁰³ Chen, "Nationalism, Internationalism, and Chinese Foreign Policy," 50.

¹⁰⁴ Yinan He, "History, Chinese Nationalism and the Emerging Sino-Japanese Conflict," *Journal of Contemporary China* Vol. 16, no. 50 (February 2007): 1; Zhao, "Foreign Policy Implications of Chinese Nationalism Revisited: The Strident Turn," 536; Gries, "Chinese Nationalism: Challenging the State?" 251.

¹⁰⁵ Zhao, "Foreign Policy Implications of Chinese Nationalism Revisited: The Strident Turn," 540.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid., 542.

Chinese embassy in Kosovo, as well as the 2001 mid-air collision between a U.S. EP-3 and a Chinese jet fighter in the South China Sea.¹⁰⁸

But China's ability to exert this sort of pragmatic control of popular nationalism declined after the 2008 GFC and the slowdown of China's economy. As Chinese elites lose the ability to leverage economic growth to maintain legitimacy, they will become more unwilling, or even unable, to control popular nationalism. China's current president and party leader, Xi Jinping, is particularly exposed to nationalist opinion because of the way in which he has consolidated power. Prior to assuming office as China's new president in 2012, Xi witnessed the "collective presidency" which distributed power across the CCP Standing Committee, and constrained then President Hu Jintao's influence so completely that he was nicknamed the, "woman with bound feet."¹⁰⁹ To reverse this, Xi surrounded himself with "a shadow cabinet that was defined less by a single ideology than by school ties and political reliability."¹¹⁰

Xi has limited collective leadership and marginalized traditional institutions of governance, and relies on a small group of advisors who are more loyal than experienced. The National Security Commission, for example, is led by two figures loyal to Xi but have little foreign policy experience. And with regard to foreign policy decision making, Xi has reduced the role of the State Council, Foreign Ministry, and the military.¹¹¹ He has consolidated so much power, that he is personally at the center of every major policy decision, and is arguably China's most authoritarian leader since Mao:

¹⁰⁸ Ibid., 540. Actions by the CCP to tamp down Chinese protests concerning Japanese claims over the Diaoyu Islands are another example of the central government's ability to constrain nationalism when needed, see Phillip C. Saunders and Erica S. Downs, "Legitimacy and the Limits of Nationalism: China and the Diaoyu Islands," *International Security* Vol. 23, no. 3 (Winter, 1998-1999): 139.

¹⁰⁹ Evan Osnos, "Born Red," *The New Yorker* (April 6, 2015).

¹¹⁰ Ibid.

¹¹¹ Robert D. Blackwill and Kurt M. Campbell, "Xi Jinping on the Global Stage: Chinese Foreign Policy under a Powerful but Exposed Leader," *Council on Foreign Relations* Special Report No. 74 (February 2016): 6.

He has acquired or created ten titles for himself, including not only head of state and head of the military but also leader of the Party's most powerful committees—on foreign policy, Taiwan, and the economy. He has installed himself as the head of new bodies overseeing the Internet, government restructuring, national security, and military reform, and he has effectively taken over the courts, the police, and the secret police. "He's at the center of everything," [said] Gary Locke, the former American Ambassador to Beijing.¹¹²

Because Xi established such clear dominance in the national decision-making process, it has left him with near total responsibility over the government's economic policies. As these policies continue to prove ineffective in reversing China's declining economic growth, Xi becomes more exposed to popular nationalism:

Xi is exposed precisely because he sits at the center of all decision-making and is visible to the public. He must address countless domestic challenges for which he is now explicitly accountable, and a major misstep on any of them could be costly to his political popularity and position. Without question, the largest problem looming over Xi's tenure is China's economic slowdown and its related manifestations, including unemployment and stock market volatility.¹¹³

As Xi and his relatively small group of policy making elites continue to grapple with concerns over economic growth and rising social unrest, concerns over political instability will become a driving factor for foreign policy: "For this reason, Xi will most probably stimulate and intensify Chinese nationalism—long a pillar of the state's legitimacy—to compensate for the political harm of a slower economy, to distract the public, to halt rivals who might use nationalist criticisms against him, and to burnish his own image."¹¹⁴ This is evidenced by his development

¹¹² Evan Osnos, "Born Red," *The New Yorker* (April 6, 2015).

¹¹³ Blackwill and Campbell, "Xi Jinping on the Global Stage: Chinese Foreign Policy under a Powerful but Exposed Leader," 10.

¹¹⁴ *Ibid.*, 4.

of an image as an assertive strongman, not unlike that of President Putin to whom Xi reportedly said in 2013, “We are similar in character.”¹¹⁵

The degraded ability for the CCP to control popular nationalism is linked to water insecurity with India because of the dispute that China has with India over the Arunachal Pradesh and India’s support of the Dalai Lama and the TGIE. Should events occur that inflame public opinion, the CCP may prove unable or unwilling to confront popular nationalism for the sake of broader national interests. Such a development would set the conditions in which a water war could occur between the two countries.

¹¹⁵ Evan Osnos, “Born Red,” *The New Yorker* (April 6, 2015).

V. Putting It All Together – Scenario Formation

When synthesizing driving forces in order to develop the plotline for scenario formation, it is important to assess how the driving forces interact with each other, and to determine if they are trending in a certain way. With regards to this scenario, a worrisome plotline emerges regarding how these driving forces could interact. Growing water insecurity, concerns over China's true intentions with regards to water diversion, and a Chinese economic slowdown coupled with increased popular nationalism, paint a rather bleak picture for future relations between India and China. Considering that China's economic problems already hamstringing the CCP's ability to cope with water scarcity, the Grand Western Water Diversion Project becomes increasingly attractive. This could lead to military conflict between the two states. Here is how it could unfold.

It is the beginning of year 2025, and the CCP continues to struggle to maintain its hold on power. The Chinese economy has just finished year five of an ongoing recession that started in 2020. With GDP growth at an anemic rate of less than 1 percent, 2025 is not shaping up as a year of recovery. Mass demonstrations and popular nationalism is the norm. The CCP is under heavy pressure for political reforms that would inhibit its ability to decide what legislation gets passed and how to select party members for key provincial and national government positions.

Meanwhile, the TGIE and the Tibet Youth Congress, operating out of India, are now more powerful than ever. Protests in Tibet against Chinese rule occur on a daily basis. Then, the 14th Dalai Lama announces that he has found his successor, the 15th Dalai Lama, reincarnated in the body of a boy in Tibet. Well organized opposition groups in Tibet smuggle the boy to India where he is granted asylum and is officially recognized by the Dalai Lama and the TGIE. This

infuriates the CCP who have long claimed that they would play a role on who succeeds as Dalai Lama and that the successor would remain in Tibet.¹

In retaliation, China officially announces that it will go ahead with the GWWDP. In truth, it had already started making preparations to continue this project, and has kept it hidden from the public. Having failed in its attempts to use water conservation techniques to fight pollution and to become more water efficient, the GWWDP has become extremely attractive to the CCP as a way of not only dealing with the water scarcity but also for launching a massive public project that would employ more people and inject more money into the economy. Of course, this angers India.

India puts its already considerable forces in and around the Arunachal Pradesh on high alert and plans for possible air strikes. It had already started this military buildup back in 2008 when then Indian PM Manmohan Singh visited the province and announced a major infrastructure development package.² In 2009, India deployed an additional 60,000 soldiers to Assam, near Arunachal Pradesh, bringing the total number of troops in the area to 100,000.³ It also built three new airstrips in the Himalayan foothills.⁴ Since then India has continued to develop the logistics infrastructure to support the deployment and sustainment of additional troops and armored forces in the area.

As China begins actual construction of the massive tunnel intended to divert water, India warns of air strikes on the dams on the Yarlung Tsangpo River. China mobilizes its considerable forces in Tibet for a possible preemptive attack to protect the dams that China built along the

¹ The debate over succession is playing out right now. The CCP has stated that it must have a say on who the 15th Dalai Lama will be. In retaliation, the current Dalai Lama has indicated that there may not be a succession at all, and that he will announce his final decision on the matter before he turns 90 in the year 2025. See Chris Buckley, "China's Tensions with Dalai Lama Spill into the Afterlife," *New York Times*, March 11, 2015.

² Dutta, "Revisiting China's Territorial Claims on Arunachal," 572.

³ Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," 14.

⁴ Bolton, "Water Wars: Rivalry Over Water Resources," 61.

Yarlung Tsangpo. India looks to the U.S. for assistance, which places it in the uncomfortable situation of being pulled into a major regional conflict between two great regional powers. This is not the first time that the U.S. found itself in such a predicament with regard to India and China.

Back on November 19th, 1962, when the Sino-Indian War was at its worst point for India, PM Nehru wrote two letters to U.S. President Kennedy describing India's situation as desperate and asked for comprehensive military aid. He specifically asked for a minimum of 12 squadrons of supersonic fighters, radar support, and U.S. Air Force personnel to man them.⁵ Although it did not provide direct air support to India, probably due to concerns of provoking a war with China while the U.S. focused on the aftermath of the Cuban Missile Crisis, the U.S. did send C-130s laden with military equipment and ammunition. It also dispatched the USS Enterprise to a nearby location to show support for India.⁶

In the U.S., as the President mulls over India's latest request for military aid, he or she asks the National Security Advisor, how did we get to this point and what could we have done to prevent this?

⁵ Kudaisya, "Beyond the 'Himalayan Pearl Harbor'," 4.

⁶ Riedel, "JFK's Overshadowed Crisis," 56.

VI. Recommendations

Answering such questions as to what led to such a scenario lies at the heart of scenario planning. It is not a question of whether a scenario is correct or not that matters. But rather it is whether a scenario is feasible, and if so, which driving forces that contributed to the plotline could an actor, or actors, affect in order to change the outcome of a scenario. When one looks at the driving forces at play in this scenario, it becomes clear that there are many different ways to influence future outcomes. Reducing water scarcity through the application of better technologies could help China take the GWWDP completely off the table. Coalition building between downstream states could create better information and confidence sharing between them and the upstream power, China. Improving the Chinese government's ability to implement better water conservation programs would also help the government transition through an economic slowdown. Resolving the dispute over the Arunachal Pradesh would help to de-link water insecurity from national sovereignty issues. Lastly, the U.S. should view Tibet in larger geo-strategic terms rather than from solely a human rights or ethno-separatist perspective.

Technological improvements in water conservation have made a number of options more readily available to countries like China. The processes with some of the best potential include wastewater reuse, seawater desalination, and rainwater collection. Improving the water insecurity situation for China could prevent it from resorting to the GWWDP diversion project in the future, and thus remove a major potential cause for conflict.

The U.S. has invested heavily in domestic wastewater treatment and reuse programs for both potable and non-potable applications, such as for agriculture and industry.¹ And while

¹ National Research Council, *Water Reuse: Expanding the Nation's Water Supply through Reuse of Municipal Wastewater*, National Academy of Sciences, (Washington DC, 2012): 19.

wastewater treatment for potable use was unpopular in the past, advances in water treatment technology have made such processes much more acceptable to the public. For example, the state of Massachusetts has an official policy to allow sewage discharges to rivers supplying drinking water in full confidence that its water treatment capabilities are up to task for generating clean potable water.²

Better wastewater reuse for both potable and non-potable purposes would greatly benefit China. Its agriculture and manufacturing industries would greatly benefit from wastewater treatment for non-potable water. China's manufacturing industry would also greatly benefit. A 2005 survey of 509 cities revealed that only 23 percent of factories properly treated wastewater before disposing of it. According to another report, today one-third of all industrial wastewater in China and two-thirds of household sewage are released untreated. The Yangtze River, which stretches all the way from the Tibetan Plateau to Shanghai, receives 40 percent of the country's sewage, 80 percent of it untreated. The Yellow River supplies water to more than 150 million people and 15 percent of China's agricultural land, but two-thirds of its water is considered unsafe to drink and 10 percent of its water is classified as sewage.³

Perhaps no other option is as promising for providing a seemingly endless amount of freshwater as seawater desalination. This has already become an accepted process in many countries. For example, early large-scale desalination plants were constructed in the arid Persian Gulf countries using a process called thermal desalination where the seawater is heated and the evaporated water is condensed to produce fresh water. Since then, the technology has improved and now many countries have constructed large-scale plants using the newer and more efficient

² Ibid., 22. For an example of how it is being applied in California, see G. Tchobanoglous, H. Levering, M. H. Nellor, and J. Crook, *Direct Potable Reuse*, WasteReuse Research Foundation, (Alexandria, VA, 2011).

³ Economy, "The Great Leap Backward? the Costs of China's Environmental Crisis."

reverse osmosis process. Although the process still requires significant amounts of energy, the technology continues to improve.⁴

Improving the Chinese government's ability to manage water conservation efforts is yet another way to ameliorate water scarcity. Consider, for example, China's most important environmental authority, the State Environmental Protection Agency (SEPA), in Beijing. SEPA has become a wellspring of China's most innovative environmental policies: it has promoted an environmental impact assessment law; a law requiring local officials to release information about environmental disasters, pollution statistics, and the names of known polluters to the public; an experiment to calculate the costs of environmental degradation and pollution to the country's GDP; and an all-out effort to halt over 100 large-scale infrastructure projects that had proceeded without proper environmental impact assessments. But SEPA operates with barely 300 full-time professional staff in the capital and only a few hundred employees spread throughout the country. The U.S. Environmental Protection Agency has a staff of almost 9,000 in Washington, D.C. alone.⁵

The government's ability to fund water conservation efforts is also far from certain. China's leaders are worried about the cost of environmental degradation and pollution on the economy. Several studies conducted both inside and outside China estimate that these costs were very substantial, between 8 percent and 12 percent of GDP annually.⁶ Of the \$85 billion targeted for environmental objectives in China's recent Five Year Plan (FYP) for 2001-2005, the central government is expected to provide only 11 percent of the funding requirement, local and provincial governments 35 percent, foreign governments and institutions 5 percent, and the rest

⁴ M. Elimelech and W. A. Phillip, "The Future of Seawater Desalination: Energy, Technology, and the Environment," *Science* Vol. 333, no. 6043 (Aug 2011): 712-715.

⁵ Economy, "The Great Leap Backward? the Costs of China's Environmental Crisis."

⁶ Economy, "The Great Leap Backward? the Costs of China's Environmental Crisis."

(almost 50 percent) from private enterprises in China.⁷

On the diplomatic front, India and China could negotiate a new treaty to replace the Simla Accord and delineate borders recognized between the two countries once and for all. While this may not look very feasible in the near future, it is important to remember that India and China worked together in the past to resolve their conflicting disputes over the Arunachal. Between the 1980s and the early 2000s, they practiced a policy of *détente* that led to hopes for a negotiated settlement. In 2000, the two countries shared for the first time maps depicting in detail the different versions of borders they recognized, and in 2003, both governments appointed special representatives to negotiate a border dispute settlement. It appeared that China was serious about settling such disputes at the time, because it resolved various border disputes with Russia, Vietnam, and several Central Asian states between 1991 and 2004.⁸

But things took a turn for the worse starting in 2005, when both sides negotiated the signing of “the Agreement on the Political Parameters and Guiding Principles for the Settlement of the India-China Boundary Question,” in which it said that, “in reaching a boundary settlement, the two sides shall safeguard due interests of their settled populations in the border areas.”⁹ India viewed this as China’s recognition of the McMahon Line, but China interpreted it very differently, and asserted that it has not changed its claim on the Arunachal Pradesh. In fact, on the eve of Chinese President Hu Jintao’s historic 2006 visit to India, the Chinese ambassador to India made a televised statement that China still claims all of the Arunachal Pradesh. Furthermore, in May 2007, the Chinese Foreign Minister, Yang Jieshi, reiterated China’s claim

⁷ Cannon, “Water as a Source of Conflict and Instability in China,” 320.

⁸ Dutta, “Revisiting China’s Territorial Claims on Arunachal,” 551.

⁹ *Ibid.*, 578.

during his talks with the Indian External Affairs Minister, Pranab Mukherjee, at the sidelines of the G-8+5 meeting in Germany.¹⁰

While these talks ultimately failed to produce a permanent resolution to the Arunachal territorial dispute, the greater point is that India and China had previously shown a willingness to negotiate on the matter. And since they already signed an agreement in 2005, they would not have to start negotiations on a brand new agreement, but could focus on amending the already existing agreement in order to clearly depict a mutually recognized border. These negotiations could also serve as confidence building measures that could result in further talks on the related topic of water insecurity along the Yarlung Tsangpo and Brahmaputra rivers. Such negotiations are necessary in order to sever the dangerous and important link between water insecurity and national sovereignty.

For the U.S., it is becoming increasingly important to recognize the full strategic importance of Tibet to the region. In addition to it being a place where ethnic separatist fault-lines and human rights issues overlap, it is also of growing strategic significance with regard to water security. As water scarcity increases in China, India, and other Asian states that depend on Tibetan headwaters, and as the glacier melt in the Himalayas accelerates due to climate change, conflict over controlling the Tibetan Plateau and its waters between great powers such as India and China will become more likely.

¹⁰ Sikri, "The Tibet Factor in India-China Relations," 64.

VII. Conclusion

This thesis paper explored the importance of examining a diverse set of factors when assessing the relationship between water insecurity and war. It is not enough to focus purely on the dynamics of how water is shared, how water scarcity is growing, or how the overall natural environment is deteriorating. War, being a human and a political endeavor, is a much more complex matter. To link water insecurity and war, one must assess the linkages between a wide array of factors that influence nations to go to war and how they could link to issues over water.

Consequently, water insecurity by itself will most likely not lead to war. However, water insecurity when coupled with other factors, such as increasing water insecurity at the source of transnational rivers, threatening behavior by the upstream state, overlapping linkages between water insecurity and national sovereignty, and decreasing political stability in the upstream state, will increase the likelihood of war. In the case of China and India, all of these conditions exist as this paper has shown.

The glaciers in Tibet are indeed melting at a faster rate, and coupled with China's growing water scarcity and its widening north – south water gap, Beijing will face growing pressure to go through with its upstream water diversion plan. This of course, will threaten India, and given that the downstream portion of the Brahmaputra flows through a disputed area with strong linkages to national sovereignty, it will cause both states to increase their security posture in the region. As China's economy continues its slowing trajectory, it will threaten the CCP's ability to pursue foreign policy uninfluenced by popular nationalism. All of these trends taken together will increase the likelihood of war between China and India.

The ability to reverse these dangerous trends are mixed. The trajectory of some of these factors is beyond the scope of any state, while others hold some promise. Water scarcity at the

source, the Himalayas, will continue to increase. The Chinese economy will continue to slow for quite some time, and as the government tries to steer a fundamental transition to a more resilient economy, the CCP will face growing pressures to adhere to populist pressures. However, it is possible for China and India to work together to separate the linkage between water insecurity and national sovereignty by resolving the Arunachal border dispute. It is also possible for China to improve its water scarcity situation through the application of better water treatment, seawater desalination, and better government management of pollution control measures.

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